U.S. Department of Transportation

Federal Aviation Administration

Advisory Circular

Subject: SPECIFICATION FOR AIRPORT LIGHT BASES, TRANSFORMER HOUSINGS, JUNCTION BOXES, AND ACCESSORIES

Date: DRAFT **AC No:** AC 150/5345-42D

Initiated by: AAS-100 **Change:**

1. PURPOSE. This Advisory Circular (AC) contains the specifications for containers designed to serve as airport light bases, transformer housings, junction boxes, and accessories.

2. EFFECTIVE DATE. Effective 6 months after the date of this circular, only that equipment qualified in accordance with this specification will be listed in AC 150/5345-53, Airport Lighting Equipment Certification Program.

a. Manufacturers who, prior to the effective date of this AC, are certified manufacturers of Class I, Type L-867 and Type L-868 bases under the previous AC 150/5345-42C will maintain their certification under this new AC for the Class I bases providing they satisfactorily complete any additional qualification testing required as part of this AC.

b. Manufacturers who, prior to the effective date of this AC, are certified manufacturers of Class II Type L-867 bases under the previous AC 150/5345-42C will maintain their certification under this new AC for the Class II bases providing they satisfactorily complete any additional qualification testing required as part of this AC.

3. CANCELLATION. AC 150/5345-42C, Specification for Airport Light Base, Transformer Housings, Junction Boxes, and Accessories, dated 9/8/89, is canceled.

4. APPLICATION. The specifications contained in this AC are recommended by the FAA in all applications involving development of this nature. For airport projects receiving Federal funds under the airport grant assistance program, the use of these standards is mandatory.

5. PRINCIPAL CHANGES.

a. Type L-867 Bases
   (1) Added additional load testing for adjustable height base
   (2) Added Class IA metallic and Class IIA non-metallic bases for use at airports using potassium acetate deicing fluids
   (3) Removed figures detailing suggested design for adjustable height base

b. Type L-868 Bases
   (1) Added Class IA metallic bases for use at airports using potassium acetate deicing fluids
   (2) Removed Class II base

(3) Added 8” Class I and Class IA base
(4) Added provision for the use of metal inserts in base flange along with flange bolt torque testing
(5) Increased load test requirement
(6) Removed 10” base
(7) Optional protective dam to base flange or spacer rings added

c. Type L-869 Bases
(1) Removed junction box

6. METRIC UNITS. To promote an orderly transition to metric units, this AC includes both English and metric dimensions. The metric conversions may not be exact equivalents, and until there is an official changeover to the metric system, the English dimensions will govern.

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Director, Office of Airport Safety and Standards

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1. SCOPE. This specification sets forth the requirements for light bases, transformer housings, junction boxes, and related accessories. This specification covers several types, classes, and sizes of bases.

1.1 Type. The type designation of the bases distinguishes their application as follows:

Type L-867	Bases for applications subject to occasional light vehicular loading but no aircraft or other heavy vehicular loading.
Type L-868	Bases for applications subject to aircraft and other heavy vehicular loading.

1.2 Class. The class designation applies as follows:

Class I	Bases that are fabricated from steel in exact conformance to the dimensions and requirements specified herein.
Class IA	Bases that are fabricated from metal in exact conformance to the dimensions and requirements specified herein and which have been subjected to corrosion testing and found resistant to deicing fluids containing potassium acetate
Class II	Bases that are fabricated from non-metallic materials in exact conformance to the dimensions and requirements specified herein.
Class IIA	Bases that are fabricated from non-metallic materials in exact conformance to the dimensions and requirements specified herein and which have been subjected to corrosion testing and found resistant to deicing fluids containing potassium acetate.
Note 1	Bases which meet the Class IA or Class IIA requirements are also assumed to meet Class 1 or Class II requirements respectively.
Note 2	Bases that are fabricated as either Class I or Class IA are to perform the same exact function. The only difference between the two classes of bases is the possible difference in metal or metal surface treatment required to meet the Class IA level of testing.
Note 3	Bases that are fabricated as either Class II or Class IIA are to perform the same exact function. The only difference between the two bases is the possible difference in material or material surface treatment required to meet the Class IIA level of testing.

1.3 Size. Five base size designations are assigned. The size refers to the nominal diameter of the base. Sizes and applicable types are as follow:

Size	**Type**
Size A - 8 inch (203 mm)	Type L-868
Size B - 12 inch (305 mm)	Type L-867 and Type L-868
Size C - 15 inch (381 mm)	Type L-868
Size D - 16 inch (406 mm)	Type L-867

Size E - 24 inch (610 mm) Type L-867

2. APPLICABLE DOCUMENTS. The following documents are referenced or complement the information presented in this AC.

2.1 FAA Advisory Circulars. FAA AC listed below contains information pertinent to this specification. Copies of the current edition of the AC may be obtained at no charge from the FAA Website at:

http://www1.faa.gov/arp/150acs.cfm?ARPnav=acs

AC 150/5340-30	Design and Installation Details for Airport Visual Aids

2.2 Federal Specifications. The following Federal specification (in effect on the date of application for qualification) forms a part of this specification and is applicable to the extent specified herein. Copies of Federal specifications may be obtained at no charge from: General Services Administration Offices in Washington, DC, and other cities. For access to Federal Specifications go to:

http://www.gsa.gov/Portal/gsa/ep/contentView.do?contentId=10766&contentType=GSA_BASIC

QQ-Z-325	Zinc Coating, Electrodeposits, Requirements for

2.3 Military Standards and Specification. The following Military Standards and Specifications (in effect on the date of application for qualification) form a part of this specification and are applicable to the extent specified herein. Copies of military standards and specifications may be obtained at no charge from: Commanding Officer, ATTN: Code 1052, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120. Check for Military Standards on the Web at:

http://www.dodssp.daps.mil/

2.3.1 Military Standards.

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-810	Environmental Test Methods

2.3.2 Military Specification.

MIL-P-26915	(USAF) Primer Coating, Zinc Dust Pigmented, for Steel Surfaces

2.4 American Society for Testing and Materials (ASTM) Specifications, Test Methods, Standard Practices, and Recommended Practices. The following specifications, test methods, standard practices, and recommended practices (in effect on the date of application for qualification) form a part of this specification and are applicable to the extent specified herein. Copies of ASTM specifications, test methods, and recommended practices may be obtained from: American Society for Testing and Materials. Contact them at:

http://www.astm.org

A 36	Standard Specification for Structural Steel

A 153	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
A 385-03	Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
A123/A123M-02	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
B 633	Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
C 109	Test Method for Compressive Strength of Hydraulic Cement Mortars
C 617	Standard Practice for Capping Cylindrical Concrete Specimens
C 827	Early Volume Change of Cementitious Mixtures
D 2240	Standard Test Method for Rubber Property-Durometer Hardness

2.5 American National Standards Institute (ANSI). The following standard (in effect on the date of application for qualification) forms a part of this specification and is applicable to the extent specified herein. Copies of ANSI standards may be obtained from the National Standards Institute. Contact them at http://www.ansi.org/,

B46.1	Surface Texture

2.6 Miscellaneous Documents.

The Design, Installation and Maintenance of In-Pavement Airport Lighting by Arthur S. Schai, F.I.E.S. Library of Congress Catalog Card Number 86-81865.

3. REQUIREMENTS.

3.1 General Description and Intended Use.

3.1.1 Type L-867 Bases. Type L-867 is used as a mounting base for airport lights, as a transformer housing, and as an electrical junction box. Type L-867 base shall be designed to withstand occasional light vehicular loads. It is subject to direct earth burial with and without concrete backfill.

3.1.2 Type L-868 Bases. Type L-868 is used as a mounting base for in-pavement airport lights, as housing for series circuit transformers, and as an electrical junction box. It shall be designed to withstand aircraft and other heavy vehicular loadings. The design must allow the installation of any in-pavement fixture, designed for mounting on the specified base size, to do so without any modification of the base whether the mounting is a new installation, or on a base that has been modified in height due to pavement elevation changes. The base, when installed, must contain all components that are manufactured to the same class, except in the case when a Class II is converted to a Class I application. The Type L-868 top flange and base must be designed to meet the dimensional requirements and performance requirements, as detailed in this document, in order to assure proper mating between base and in-pavement lighting fixture.

3.1.3 General Accessories. Accessories are used to make corrections, and adjustments to Type L-867 and Type L-868 bases, and to facilitate proper performance of the lighting fixture which the base supports. Examples are listed below, and when used in conjunction with a base specified in this AC, shall not reduce the performance capabilities of that base.

3.1.3.1 Spacer Rings. Spacer rings are available in various designs depending on the application and are available in various thicknesses and diameters and are generally installed between the base flange and the light fixture or other accessory. See Figures 3 and 8 for minimum and maximum height. In order to preserve the base integrity and proper bolt torque, a maximum of three spacer rings (Schai document, ref. par.2.6) may be stacked together. Each type of L-868 spacer ring, when interfaced to the fixture housing, may be provided with a protective band that encircles the spacer ring. The protective band is ⅛″ shorter than the fixture housing it protects and has an ID that is a maximum 1/4″ greater than the OD of the fixture housing. The OD of the ring is unchanged when a protective band is included. The various types of spacer rings are noted below.

Note: The protective band prevents grout, sealant, or other pavement material from sealing the fixture in place and preventing easy maintenance access to the fixture or base.

3.1.3.1.1 Flat Spacer Ring. A flat spacer ring is used to provide height adjustment for Type L-867 or Type L-868 bases.

3.1.3.1.2 Grooved Spacer Ring. A grooved spacer ring, when used with a provided “O” ring gasket, is used to provide a seal between the in-pavement fixture and spacer ring for the purpose of minimizing the entrance of surface water and other liquids into the base.

3.1.3.1.3 Tapered Spacer Ring. Tapered spacer rings are used to provide level and/or height correction for out-of-level Type L-868 bases.

3.1.3.1.4 Azimuth Correction Spacer Ring. Azimuth correction spacer rings are used to correct the alignment of light fixtures attached to misaligned bases.

3.1.3.2 Conduit Connections. Conduit connections permit connection of underground conduit to the bases. Conduit connections (number, type, size, and location) are to be provided as specified and must meet the environmental requirements of the Class base with which they are utilized. Conduit connections may include hubs, grommets, or other devices suited for the application.

3.1.3.3 Adapter Rings. Adapter rings are used for converting the bolt circle of an existing base to that of a fixture having a different bolt circle. No modification of the existing base shall be required. All fixture mounting bolts must have at least ½” of thread engagement into the ring.

3.1.3.4 Base Extensions. Base extensions are used to provide height adjustments to both Type L-867 and Type L-868 bases. They are used with bases when the required new elevation exceeds the capability of spacer rings to obtain it. Base extension capability can be provided by installing an appropriate height extension to the top flange of an existing base that has the same dimensional top flange as the original base. Extensions are equal or greater than 1.75" for Type L-867 and 2.00" for Type L-868. Extensions and spacers will be dimensioned as shown in Figures 3 and 8.

If the base or extension height adjustment utilizes a method that is adjustable and integral to the base or extension, it shall conform to the same base and fixture interface dimensions as required for the conventional extension. See Figures 3 and 8.

Type L-867 bases with provisions for height adjustment may be specified to meet local conditions. These base extensions, which rely on the top flange and the embedment material to support the load, are not suitable for direct earth burial. If the adjustable height base is intended to support the load without top flange and embedment assistance, it is suitable for direct earth burial and must be capable of withstanding the full load test requirement at its maximum extension.

All bases that utilize a method of height adjustment that is integral to the base or extension and is intended for field adjustment, must during qualification testing be subject to a torque test to ensure there will be no top flange rotation under normal operating conditions. Ref. par 4.1.7, 4.2.8 and 4.3.8.

3.1.3.5 Covers. Various covers are available to facilitate the proper installation of bases. All covers shall be furnished with fully threaded 18-8 stainless steel hex head 3/8 inch bolts sufficiently long to provide full thread engagement into the mounting surface

3.1.3.5.1 Blank Covers. Blank covers are used to provide a cover for bases when no light fitting is to be installed. They shall be metallic and meet the applicable dimensional requirements of the type base to which they are attached. For Type L-868 load bearing base, the cover shall be equal in thickness to the light fixture. For Type L-867B and Type L-867D non-load bearing bases the cover shall be a minimum of .0.375". For Type L-867E base, the cover shall be a minimum of 0.500". Covers thicker than .75”, shall have (2) opposite holes of the (6) 7/16” through holes tapped ½”-13, as a means to affix a lifting eye for ease of removal. All cover plates ½” or thicker shall have all bolt holes counter-bored 1.125” x 3/8” deep.

3.1.3.5.2 Mud Covers. Mud covers may stand alone or may be used in conjunction with plywood covers on Type L-867 and Type L-868 bases to protect the base flange during construction, and to include surface marking to facilitate locating the center of the base when coring out to locate the base after an asphalt overlay. Mud covers are appropriately sized for the specific bases they are to protect.

3.1.3.5.3 Plywood Covers. Plywood covers are used to protect bases during shipping and installation and are to be installed on all base or base extension shipments. For all galvanized bases, a 3 mil poly shipping gasket shall be installed between the base and plywood to eliminate the bonding action of the plywood and zinc. Plywood shall be exterior grade bb/cc ½” thick for Type L-867 and equal to the thickness of the light fixture (0.75” or 1.25”) to be installed on the base. When shipped with a mud cover on top, the total thickness of mud cover and plywood cover shall equal the thickness of the light fixture. The Type L-868 cover should be waxed on the OD edge to facilitate easy removal from any surrounding embedment material.

Note: Thickness of the fixture is determined to be the height of fixture flange at the OD of the fixture

3.1.3.6 Grounding Lugs. For the purpose of enhancing safety, each base shall have installed, by the manufacturer, an internal and external ground strap that is available for the purpose of attaching a ground lug that is connected to an earth ground or a safety ground conductor installed in the series circuit conduit.

3.1.3.7 Drains. The conduit/base system, which protects the series circuit cable, should have drains installed in the bases at low points in the system to provide for drainage of water and deicing fluids, which if allowed to pool for long periods of time, will hasten corrosion of the conduit/base system.

3.2 Fabrication and Materials. Bases and related accessories, designed to function as light bases, transformer housings, and junction boxes, shall be fabricated of suitable material to meet the following standards. For all Class IA bases the selection of material by the manufacturer must be certified by the manufacturer to the third party tester not to possess any fatigue characteristic for the intended applications.

3.2.1 Type L-867 Bases and Extensions, Class I and Class IA. Type L-867 Class I bases and extensions shall be fabricated from steel conforming to ASTM A 36 using fabrication techniques that will produce units meeting the appropriate testing requirements of Section 4.1. Class IA bases shall be fabricated from metal using fabrication techniques that will produce units meeting the appropriate testing requirements of Section 4.1.

3.2.1.1 Flange. The dimensions of the flange shall be as shown in Figure 1. The flat surface of the flange shall be installed at an angle of 90 plus or minus 0.25 degrees to the axis of the cylindrical body. The flange shall be continuously attached to the body to provide a watertight seal.

3.2.1.2 Body. The body, including the sides and bottom, shall be fabricated from one or more pieces. The standard dimensions of the body shall be as shown in Figure 2. Two conduit entrances shall be provided and installed near the bottom of the base.. The location and size, as shown in Figure 2, shall be considered standard. However, the location, number, type, and size can be altered to meet project requirements. Any sharp edges formed on the inside of the body shall be removed to prevent cutting or chafing of the cable insulation. The length of the body section as shown in Figure 2 shall be considered standard, but the length may be varied to meet special conditions.

3.2.1.3 Extensions. The dimensions of the extensions and spacer rings shall be as shown in Figure 3. Extensions for Type L-867 bases shall be ordered to length with a minimum length of 1-3/4 inches (44.5 mm) and a tolerance of plus or minus l/16 inch (1.5 mm). Flat spacer rings are utilized for height adjustments from l/16 inch (1.5 mm) through l-11/16 inches (42.86 mm) in l/16 inch (1.5 mm) increments. In order to preserve the base integrity, a maximum of three spacer rings may be stacked together.

3.2.1.4 Adjustable Height Type L-867, Class I and Class IA Bases. Adjustable height Type L-867, Class I and IA bases shall have a provision for adjusting the height of the base top flange. Various methods of providing height adjustment are possible. The body and top flange shall be identical to the body and top flange of the standard base. The adjustable top flange and supporting wall may mate into the base body either externally

or internally of the base supporting wall. If the adjustable base is designed for installation in earth (no embedment support required), the base shall be load tested fully extended in free space. If the base requires PCC embedment in order to meet the loading requirements, it shall be tested with supporting PCC embedment to simulate actual installation as directed by the testing laboratory. The manufacturer shall indicate on each shipped base that the base does not meet the load requirements of Type L-867 unless the top base flange is embedded and supported by PCC. These bases shall be dimensioned as shown in Figure 2.

3.2.1.5 Bolts. Bolts suitable for use in threaded holes, as shown in Figures 1 and 2, shall be supplied with each base and extension assembly. The bolts shall conform to the dimensions specified in the notes in Figures 1, 2, and 3 and shall be fully threaded and fabricated from 18-8 stainless steel.

3.2.2 Type L-867 Bases and Extensions, Class II and Class IIA. Type L-867 bases and extensions, Class II and IIA, shall be fabricated from suitable materials and dimensioned so as to produce units meeting the appropriate testing requirements of Section 4.1.

3.2.2.1 Flange. The flange shall be fabricated from suitable materials and shall meet the same critical lighting fixture interface dimensions specified for Class I in Figure 1. Flange thickness and material shall be sufficient to pass the load test specified in paragraph 4.1.1. The flange shall be continuously attached to the body to provide a watertight seal.

3.2.2.2 Body. The body, sides, and bottom may be fabricated from one or more pieces. The sides and bottom shall be fabricated from suitable materials sufficient to pass the load test described in paragraph 4.2.1. Two conduit entrances shall be installed near the bottom of the base. The location and size, as shown in Figure 2, shall be considered standard. However, the location, number, type, and size may be altered to meet project requirements. Any sharp edges formed on the inside of the body shall be removed to prevent cutting or chafing of the cable insulation. The length of the body section as shown in Figure 2 shall be considered standard, but the length may be varied to meet special conditions.

3.2.2.3 Extensions. The dimensions of the extensions and spacer rings shall be as shown in Figure 3. Extensions shall be fabricated of the same materials and dimensions specified in paragraphs 3.2.2.1 and 3.2.2.2 above. Extensions shall be ordered to length with a minimum length of l-3/4 inches (44.5 mm) and a tolerance of plus or minus l/16 inch (1.5 mm). Flat spacer rings are utilized for height adjustments from l/16 inch (1.5 mm) through l-11/16 inches (42.86 mm) in l/16 inch (1.5 mm) increments. In order to preserve the base integrity, a maximum of three spacer rings may be stacked together.

3.2.2.4 Adjustable Height Type L-867, Class II Bases. Adjustable height Type L-867, Class II and IIA bases shall have a provision for adjusting the height of the base top flange. Various methods of providing height adjustment are possible. The body and top flange shall be identical to the body and top flange of the standard base. The adjustable top flange and supporting wall may mate into the base body either externally or internally of the base supporting wall. If the adjustable base is designed for installation in earth (no embedment support required) the base shall be load tested fully extended in free space. The manufacturer shall indicate on each shipped base that the base does not meet the load

requirements of Type L-867 unless the top base flange is embedded and supported by PCC. If the base requires PCC embedment in order to meet the loading requirements, it shall be tested with supporting PCC embedment to simulate actual installation as directed by the testing laboratory. These bases shall be dimensioned as shown in Figure 2.

3.2.2.5 Bolts. Bolts suitable for use in threaded holes as shown in Figures 1, 2, and 3 shall be supplied with each base and extension assembly. The bolts shall conform to the dimensions specified in the notes in Figures 1, 2, and 3, and shall be fully threaded and fabricated from 18-8 stainless steel.

3.2.3 Type L-867 Accessories. Various accessories are necessary to facilitate construction involving Type L-867 bases or to make corrections or adjustments to Type L-867 bases. These accessories are detailed in Figure 4.

3.2.4 Type L-868, Class I and Class IA Bases and Extensions. Type L-868, Class I bases and extensions, shall be fabricated from steel conforming to ASTM A 36 and constructed in such a manner as to meet the appropriate testing requirements given in paragraphs 4.3. Class IA bases and extensions shall be fabricated from an appropriate metal and constructed in such a manner as to meet the appropriate testing requirements given in Section 4.4.

3.2.4.1 Flange. The dimensions of the flange shall be as shown in Figure 10. The flat surface of the flange shall be installed at an angle of 90 degrees, plus or minus 0.125 degrees, to the axis of the cylindrical body of the base. The flange shall be continuously attached to the body to provide a watertight seal. The flange face, outside and inside diameter, shall be finished in accordance with ANSI B 46.1. Bolt hole size and placement shall be as shown in Figure 5. Bolt hole may be integral to the flange or contained in metal insert located in the flange. A specified bolt installed in the flange bolt hole shall be capable of accepting a bolt torque test as indicated in paragraph 4.3.2. As part of the base prototype testing, any insert or remedial device used for correcting threads damaged while in service shall be tested in the base flange as part of the base in which it is intended for service.

3.2.4.2 Body. The body section, sides and bottom, may be formed from one or more pieces. One piece body sections shall have an anchor ring (mid-ring) attached to the body by a continuous weld applied to the upper side and lower side of the ring as shown in Figure 6. The length of the one piece body section shown in Figure 6 shall be considered a standard, but the overall length may vary to meet specific conditions. Two 2-inch (51 mm) conduit entrances shall be provided near the bottom of the body. The location, number, and size of conduit entrances shown in Figure 6 shall be considered standard, but the size, location, and number of connections may be varied to meet specific conditions. Any sharp edges at the conduit entrances shall be removed to prevent cutting or chafing of the cable insulation. When sectional bases are specified, the sections shall be dimensioned as shown in Figure 7.

3.2.4.3 Extensions. Extensions shall be fabricated from the appropriate metal for either Class I or Class IA bases. The dimensions of extensions shall be as shown in Figure 8. The minimum extension length shall be 2 inches (51 mm Flat spacer rings shall be used for height corrections of l/16 inch (1.6 mm) to l-15/16 inches (49 mm) in l/l6 inch (1.6 mm) increments. Flat spacer ring dimensions are shown in Figure 8. If specified,

grooved spacer rings may be used for height corrections of l/4 inch (3.2 mm) to l-15/16 inches (49 mm) in l/16 inch (1.6 mm) increments.

3.2.4.4 Bolts. Bolts suitable for use in the threaded holes as shown in Figures 5, 6, and 7 shall be supplied with each spacer ring. These bolts shall be of sufficient length to provide a full thread connection with the base flange when the spacer ring is inserted between the light fixture and the base flange. If bases or extensions are ordered without spacer rings, bolts conforming to the dimensions specified in the notes in Figures 5, 6, and 7 shall be supplied. All bolts shall be fully threaded and fabricated from 18-8 stainless steel and supplied with locking washers.

Note: Anti-seize material may be specified to be furnished and utilized by the installing contractor when installing bolts. Anti-seize material is normally not supplied by the base manufacturer due to the various airport preferences for different brands of material.

3.2.5 Type L-868 Accessories. Various accessories are necessary to facilitate construction involving Type L-868 bases or make corrections or adjustments to Type L-868 bases. These accessories are detailed in Figure 9.

3.2.6 Ground Lug. Ground connectors or straps shall be supplied with each base. For metallic bases, a metallic ground connector or strap shall be welded to the interior and exterior wall of each base before applying surface protection. The details and location of the ground connectors are shown in Figures 2 and 6. The location of the connector may be varied to meet specified conditions. A bronze or copper ground connector shall not be fastened to the ground connector or strap until after the base surface protection is applied. For Class II bases, the ground connector or strap shall provide a positive ground connection path to a light fixture mounting bolt. For either Class I or II the bronze or copper ground connector may be installed in the field.

3.2.7 Drains. If specified, a drain shall be provided in the bottom of the base prior to applying surface protection. When not otherwise specified, the drain shall be 3/4 inch in diameter.

3.2.8 Protective Coating. After fabrication, burrs and sharp edges shall be removed, and all ferrous metal parts shall be treated for corrosion protection. Prior to tapping operations, all parts of Class I bases, extensions, and spacer rings in excess of l/4 inch (6.35 mm) in thickness shall be hot-dip galvanized, as specified in ASTM A123/A123M-02 , and applied in accordance with ASTM ***A 385-03*** . Flanges, covers, and rings shall be wiped smooth to a flatness of plus or minus 0.010 inch (0.254 mm). Plates and rings l/4 inch (6.35 mm) or less in thickness, grooved extensions, and grooved spacer rings when made of ferrous metal shall be plated with zinc in accordance with the requirements of Federal Specification QQ-Z-325, Type II, Class I. Tapped holes shall be protected with a polyurethane varnish or equivalent. A zinc dust primer meeting MIL-P-26915 (USAF) shall be permitted for touchup. The area covered by zinc dust primer shall not exceed 10 percent of the total treated area. Any cast iron may be coated with a minimum of 2.0 mils of oxyplast powder in lieu of galvanizing. Class IA base extensions and spacer rings shall utilize surface protection, as required, to meet the appropriate testing requirements stated in Section 4.4.

4. QUALITY ASSURANCE PROVISIONS. Equipment produced under this specification may be eligible for funding for installation on airports under Federal grant assistance programs for airports. In order to be eligible for installation under Federal grant assistance programs,

manufacturers of the types of equipment specified herein are required to certify or furnish proof to the airport sponsor, or the sponsor's representative, that the equipment conforms to the following prototype, production, certification, and guarantee provisions established below in Section 4.1 Prototype Testing. Prototype testing delineated below is intended to assure that the materials and fabrication methods are adequate to provide acceptable in-service performance of bases. Prototype testing is required for each type, class, and size of base produced.

4.1 Type L-867, Class I and Class IA Prototype Testing. Type L-867, Class I and Class IA bases and extensions fabricated in accordance with the materials and dimensions specified herein shall be capable of passing the following tests:

4.1.1 Type L-867, Class I and Class IA Load Test. Sample bases and extensions shall be subject to the load test described below. The base and cover assembly or assemblies including spacer rings, extensions, and multi-section bodies shall be bolted together and placed on a flat steel plate mounted in a standard testing machine. The test specimen shall be composed of a body section of standard length, 24 inches (610 mm), with four 2-inch (50 mm) conduit entrances located in the body section, located at 90° increments, 2-l/2 inches (64 mm) from the bottom of the base. A load shall be applied to the top part of the base through a block of rubber l-1/2 inches (38 mm) thick, with a diameter equal to the cover plate, and having a durometer hardness of 55 to 70. A load of 250 psi (1724 kPa) shall be applied uniformly over the area of the rubber block at a rate not to exceed 10,000 pounds (4536 kg) per minute. The base, or any of the components, shall be considered unsatisfactory if there is any permanent deformation or cracking of material or coating. The above test will be repeated three times. After each loading, bolts shall be checked for loss of tension. The bolts shall be torqued to the manufacturer's recommended service tension after the first two loadings. The base and/or assembly will be considered unsatisfactory if there is any loss of tension in the bolts or permanent deformation of the flange or coating after the third loading.

> **4.1.1.1 Type L-867, Class I and Class IA Load Test, Adjustable Height Base.** If the adjustable base is designed for installation in earth (no embedment support required), the base shall be tested fully extended in free space and shall be subject to the load test in paragraph 4.1.1. If the base requires PCC embedment in order to meet the loading requirements, it shall be tested to the requirements in paragraph 4.1.1 with supporting PCC embedment to simulate actual installation as directed by the testing laboratory.

4.1.2 Type L-867, Class I and Class IA Weld Integrity Test. This test shall be performed after each assembly has undergone the load test described in paragraph 4.1.1. An internal air or hydraulic pressure of 12 psi, plus or minus 2 psi, (83 kPa, plus or minus 14 kPa) shall be maintained within the assembly using pressure fittings. The conduit entrances shall include a sample of the conduit interfaces (hub, grommet etc.) that are offered by the manufacturer for interfacing to the conduit. The conduit entrances shall include conduit stubs suitably plugged during the conducting of the test. A high foam soap or detergent solution of low surface tension shall be brushed on welds, seams, and joints to detect leakage. Alternatively, the assembly may be submerged in a tank of water while pressurized to detect any air leakage. The assembly shall be considered unsatisfactory if leakage is evident. The conduit entrances shall be placed at least 24 inches (0.6 m) below the water surface. Any leakage of water into the assembly shall be cause for rejection.

Note: This test is not performed on bases designed to be field height adjustable.

4.1.3 Type L-867, Class I and Class IA Dimensional Tests. Specimens shall be measured for conformance to the dimensions specified in Figures 1, 2, 3, and 4, as applicable.

4.1.4 Type L-867, Class I and Class IA Protective Coating Thickness Test. When utilized, the thickness of protective coatings shall equal or exceed those specified herein. The weight of hot-dip galvanizing shall be tested according to the method described in ASTM A 153. Zinc plating thickness shall be tested by either method described in Federal Specification QQZ-325.

4.1.5 Type L-867, Class I and Class IA Visual Inspection. Each unit shall be visually inspected for quality of workmanship and materials. Particular attention shall be given to smoothness and continuity of welds and seams, flatness and smoothness of the flange surface, complete and uniform application of the protective coating, freedom from excess zinc when applicable, and absence of burrs and sharp edges.

4.1.6 Type L-867, Class IA Potassium Acetate Test. Those bases and extensions certified to Type L-867 Class IA requirements shall be subjected to testing to determine if they are resistant to corrosion caused by deicing fluids containing potassium acetate. The test shall consist of taking a test base and filling it half full with a potassium acetate deicing fluid comprised of 50 percent potassium acetate and 50 percent water, by weight. The test base will have conduit connecting devices identical to that to be furnished with the base and with conduit stubs plugged. The test base shall have mounted one grooved spacer ring of the same Class and the base shall be covered with an appropriate cover utilizing an O ring gasket. The test base will remain for 21 days at an elevated temperature of 90º C. After the test period the base and spacer ring shall be inspected. There shall be no evidence of corrosion or leakage.

4.1.7 Type L-867 Class I and Class IA Torque Test for Adjustable Height Bases. All L-867 Class I bases that utilize a method of height adjustment that is integral to the base or extension and are designed for field adjustment shall be subjected to a torque test. The test base shall be held in the maximum adjustable height position utilizing the locking method that will be utilized in the actual installation. A torque of 12,000 in-lbs shall be applied perpendicular to the vertical axis of the base utilizing a steel cover plate. The maximum torque shall be achieved within 60 seconds of the start of the test. The torque load shall be applied three times. Upon completion of the third torque loading a measurement shall be taken to determine if the base top flange has been displaced in azimuth. An azimuth displacement of 0.25 degrees or greater shall be caused for rejection. All welds or seams shall be examined for integrity and any failure shall be cause for rejection.

4.2 Type L-867, Class II and Class IIA Prototype Testing. Type L-867, Class II and Class IIA bases and extensions fabricated from materials to dimensions as specified herein shall be capable of passing the following tests.

4.2.1 Type L-867, Class II and Class IIA Load Test. Sample bases and extensions shall be subject to the load test described in paragraph 4.1.1 above.

4.2.2 Type L-867, Class II and Class IIA Weld Integrity Test. Sample bases and extensions shall be subject to the leakage test described in paragraph 4.1.2 above.

Note: This test is not performed on bases designed to be field height adjustable.

4.2.3 Type L-867, Class II and Class IIA Temperature Shock Test. Temperature shock test requirements apply only to Class II, non-metallic, Type L-867 bases. A temperature shock test shall be conducted on a completed non-metallic base assembly. The test shall be performed according to MIL-STD-810, Method No. 503.2, Section II, Procedure I. The high test temperature shall be plus 130º F (plus 54º C) and the low test temperature shall be minus 65º F (minus 54º C). This test shall be conducted on the assembly after the load test described in paragraph 4.1.1 has been concluded. Any cracking or joint separation of the materials making up the base assembly shall be cause for rejection.

4.2.4 Type L-867, Class II and Class IIA Dimensional Tests. Specimens shall be measured for conformance to the dimensions specified in Figures 1, 2, 3, and 4, as applicable. Mounting flange and base wall thicknesses shall be measured and shall be equal to or greater than those required to pass the load test and torque test described in paragraph 4.1.1 above.

4.2.5 Type L-867, Class II and Class IIA Protective Coating Thickness Test. For components of the base or assembly requiring protective coatings, the thickness of protective coatings shall be tested in accordance with paragraph 4.1.4 above.

4.2.6 Type L-867, Class II and Class IIA Visual Inspection. Bases shall be visually inspected in accordance with paragraph 4.1.1.5.

4.2.7 Type L-867, Class IIA Potassium Acetate Test. Those bases and extensions certified to Type L-867 Class IA requirements shall be subjected to testing to determine if they are resistant to corrosion caused by deicing fluids containing potassium acetate. The test shall be conducted in accordance with paragraph 4.1.6.

4.2.8 Type L-867, Class II and Class IIA Torque Test for Adjustable Height Bases. All L-867 Class II bases that utilize a method of height adjustment that is integral to the base or extension and are designed for field adjustment shall be subjected to a torque test. The test shall be conducted in accordance with paragraph 4.1.7.

4.3 Type L-868, Class I and Class IA Prototype Testing. Type L-868, Class I bases and extensions fabricated in accordance with the materials and dimensions specified herein shall be capable of passing the following tests.

4.3.1 Type L-868, Class I and Class IA Load Test. Sample bases and extensions shall be subject to the load test described in paragraph 4.1.1 above with the following exception. A load of 450 psi (3103 kPa) shall be applied uniformly over the area of the rubber block at a rate not to exceed 10,000 pounds (4536 kg) per minute. For 8 inch Type L-868 1 inch (25mm) conduit entrances shall be used and the body section shall be 8 inches (203 mm) in height.

4.3.2 Type L-868, Class I and Class IA Flange Bolt Torque Test. Flanges shall be tested by inserting 18-8 stainless steel fixture mounting bolts in all 6 bolt holes and torque all bolts to failure. Any cracking or permanent deformation of the flange material or finish shall be cause for rejection.

4.3.3 Type L-868, Class I and Class IA Weld Integrity Test. Sample bases and extensions shall be subject to the leakage test described in paragraph 4.1.2 above.

Note: This test is not performed on bases designed to be field height adjustable.

4.3.4 Type L-868, Class I and Class IA Dimensional Tests. Specimens shall be measured for conformance to the dimensions specified in Figures 5-9.

4.3.5 Type L-868, Class I and Class IA Protective Coating Thickness Test. For components of the base or assembly requiring protective coatings, the thickness of protective coatings shall be tested in accordance with paragraph 4.1.4.

4.3.6 Type L-868, Class I and Class IA Visual Inspection. Specimens shall be subject to visual inspection as described in paragraph 4.1.5.

4.3.7 Type L-868, Class IA Potassium Acetate Test. Bases and Extensions shall be subjected to testing to determine if they are resistant to corrosion caused by deicing fluids containing potassium acetate. The test shall be conducted in accordance with paragraph 4.1.6.

4.3.8 Type L-868, Class I and Class IA Torque Test for Adjustable Height Bases. All L-868 bases that utilize a method of height adjustment that is integral to the base or extension and are designed for field adjustment shall be subjected to a torque test. The test shall be conducted in accordance with paragraph 4.1.7. except a torque of 100,000 in-lbs shall be applied

4.4 Production Testing

4.4.1 Lot Size. The lot size shall be equal to the daily production rate.

4.4.2 Sample Size and Acceptance Criteria. Production testing shall be based on the procedures given in MILSTD-105, Sampling Procedures and Tables for Inspection by Attributes. Sample size and acceptance criteria shall be based on Table 1 (Sample Size Code Letters), General Inspection Level I, Table II-A (Single Sampling Plans for Normal Inspection), and an Acceptable Quality Level (AQL) of 2.5. Note that normal inspection may be switched to reduced inspection provided the conditions set forth in MIL-STD-105 are met.

4.4.3 Retesting. If the lot is rejected, the remainder of the lot (excludes samples tested and inspected under paragraph 4.2.2) may be tested and inspected on an individual basis. As an alternative to individual testing and inspection, the remainder of the lot may be tested using criteria in MIL-STD-105 for multiple sampling. Table IVB, Multiple Sampling Plans for Tightened Inspection, using the appropriate sample size and an AQL of 2.5, shall be used. Should the lot fail under the multiple sampling plan criteria, all units shall be inspected and tested individually and repaired as necessary. Any samples that fail under any of the above criteria shall be repaired prior to shipment.

4.4.4 Type L-867, Class I and Class IA.

4.4.4.1 Dimensional Tests. Random samples from each lot shall be subjected to dimensional tests as described in paragraph 4.1.3 above.

4.4.4.2 Visual Inspection. Random samples from each lot shall be subjected to visual inspection as described in paragraph 4.1.5 above.

4.4.4.3 Weld Integrity Test. Random samples from each lot shall be subjected to the leakage test described in paragraph 4.1.2 above, except that load testing of production samples is not required.

4.4.4.4 Torque Test for Adjustable Height Bases. Random samples from each lot shall be subjected to the torque test described in paragraph 4.1.7, except the test shall only be performed on the top section of the adjustable base for the sole purpose of visually

verifying weld integrity. As an option the top section may be subjected to a weld integrity test similar to that described in paragraph 4.1.2.

4.4.5 Type L-867, Class II and Class IIA.

4.4.5.1 Dimensional Tests. Random samples from each lot shall be tested in accordance with paragraph 4.2.4 above.

4.4.5.2 Visual Inspection. Random samples from each lot shall be visually inspected in accordance with paragraph 4.1.5.

4.4.5.3 Weld Integrity Test. Random samples from each lot shall be subjected to the leakage test described in paragraph 4.1.2 above, except that load testing of production samples is not required.

4.4.5.4 Torque Test for Adjustable Height Bases. Random samples from each lot shall be subjected to the torque test described in paragraph 4.1.7, except the test shall only be performed on the top section of the adjustable base for the sole purpose of visually verifying weld integrity. As an option the top section may be subjected to a weld integrity test similar to that described in paragraph 4.1.2.

4.4.6 Type L-868, Class I and Class IA.

4.4.6.1 Dimensional Test. Random samples from each lot shall be tested for conformance to the dimensional test described in paragraph 4.3.3 above.

4.4.6.2 Visual Inspection. Random samples from each lot shall be inspected for conformance to the requirements in paragraph 4.3.5 above.

4.4.6.3 Weld Integrity Test. Random samples from each lot shall be subjected to the leakage test described in paragraph 4.1.2 above, except that load testing of production samples is not required.

4.4.6.4 Torque Test for Adjustable Height Bases. Random samples from each lot shall be subjected to the torque test described in paragraph 4.3.8, except the test shall only be performed on the top section of the adjustable base for the sole purpose of visually verifying weld integrity. As an option the top section may be subjected to a weld integrity test similar to that described in paragraph 4.1.2.

4.5 Certification. Manufacturers shall certify that all components, fabrication techniques, and materials conform to those specified herein and are equal to or better than those used for the approved prototype.

4.6 Guarantee. The manufacturer agrees to provide the following minimum guarantee for the equipment:

"That the equipment has been manufactured and will perform in accordance with the applicable specifications and that any defect in design, materials, or workmanship that may occur during proper and normal use during a period of 1 year from date of installation or a maximum of 2 years from date of shipment will be corrected by repair or replacement by the manufacturer f.o.b. factory."

5. PREPARATION FOR DELIVERY.

5.1 Packing. Equipment shall be carefully packaged for shipment and delivery to avoid damage and/or corrosion. Protective covers are to be included on all bases. (See paragraph 3.3.3.5.3)

5.2 Marking. Equipment shall be marked for shipment with the consignee's name and address, and other pertinent information as needed by the installer. Marking shall include the following statement, "Installer: These products have been packed and shipped in accordance with FAA recommendations. Products are to be handled carefully so no damage to the structure or finish will occur during the installation process"

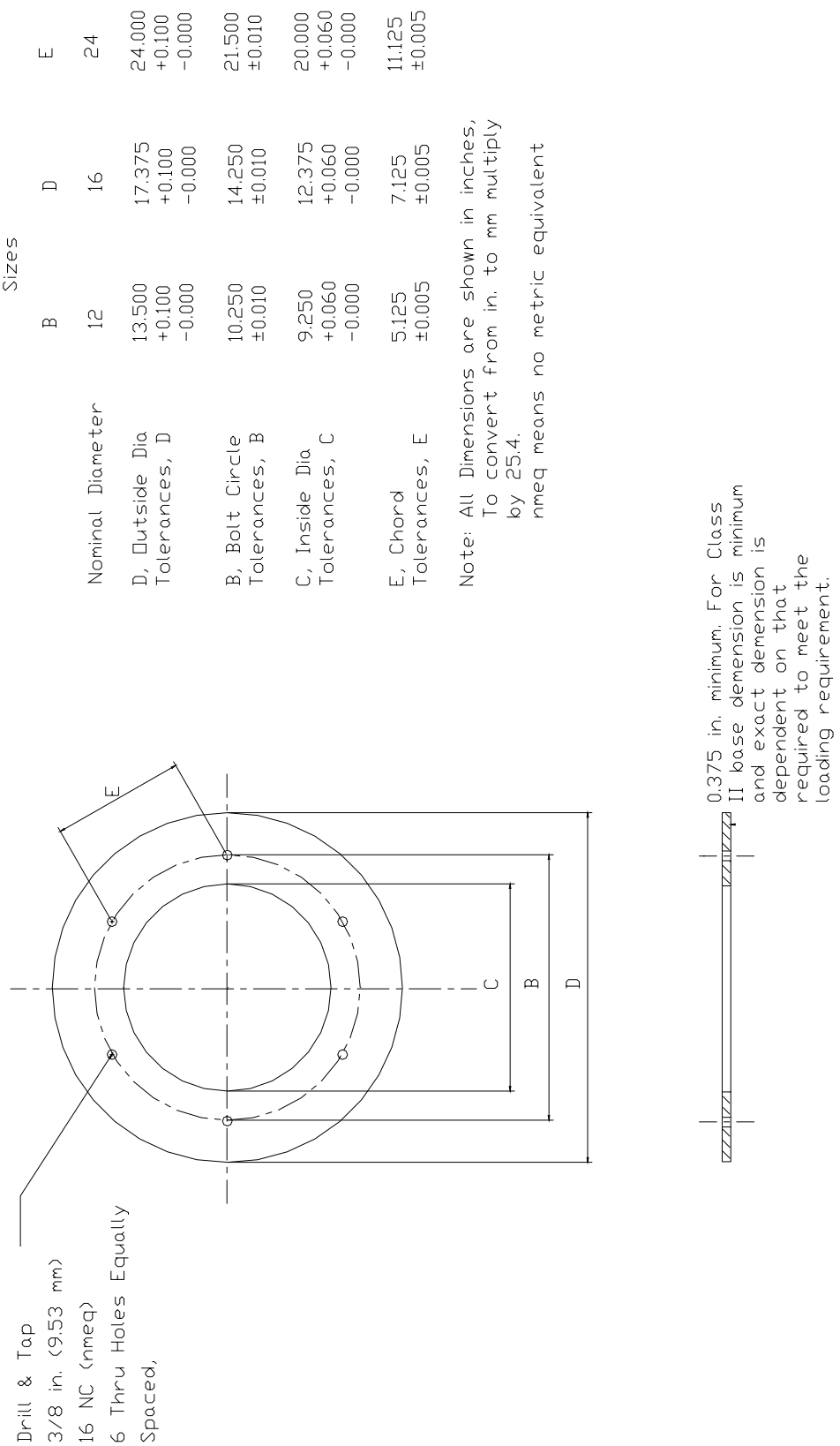


Figure 1. Flange, Type L-867, Class I and Class II

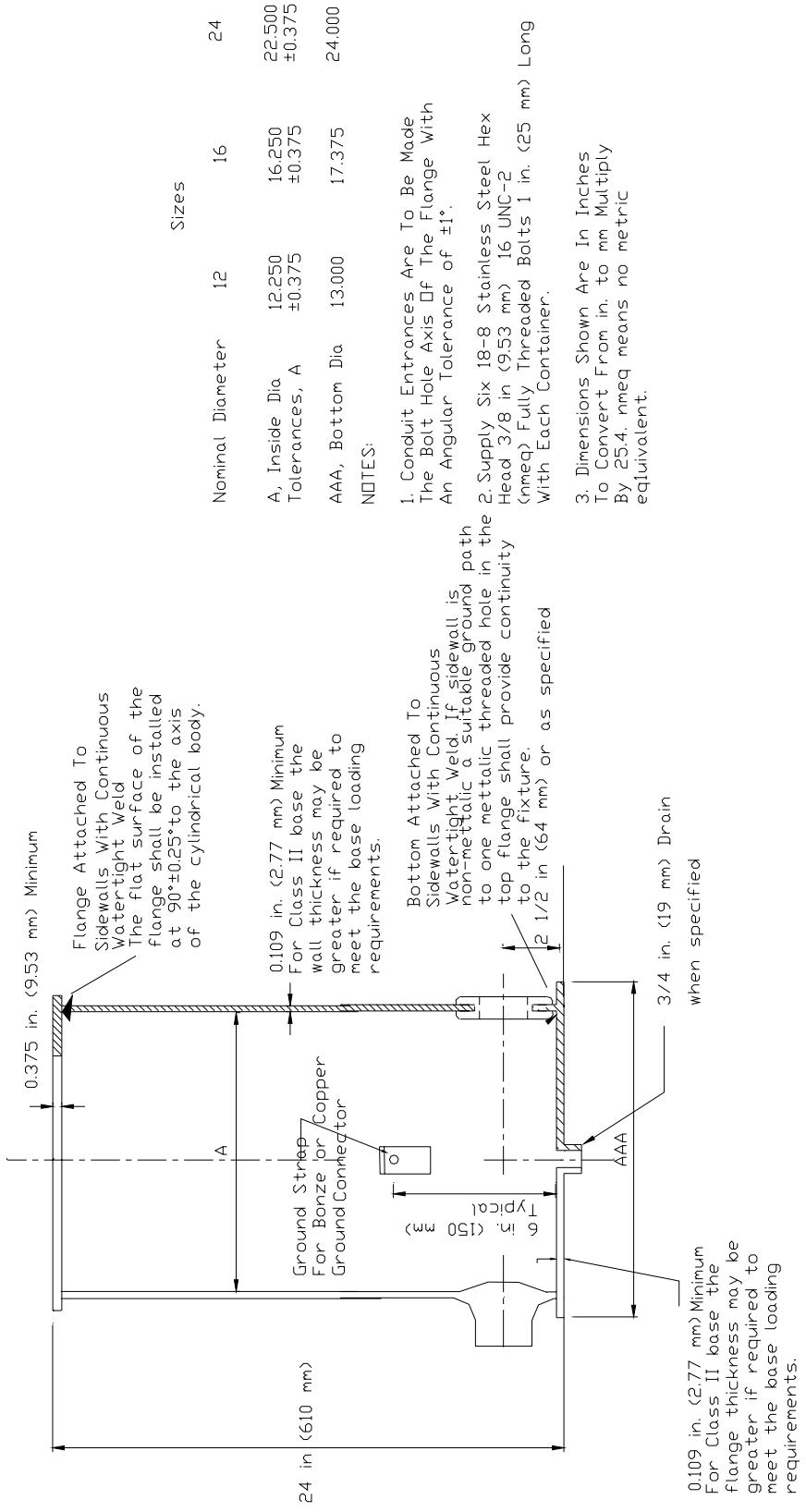


Figure 2. Body, Type L-867, Class I and Class II

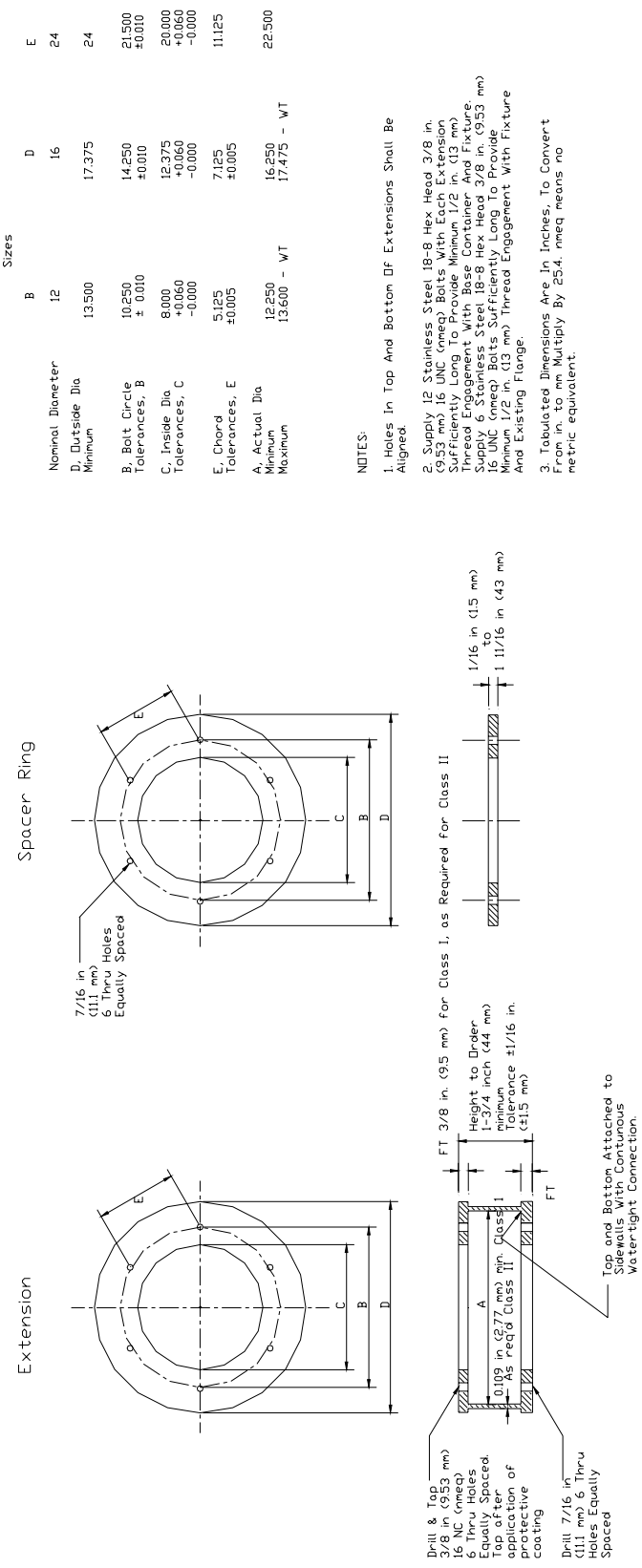


Figure 3. Extensions, Type L-867, Class I and Class II

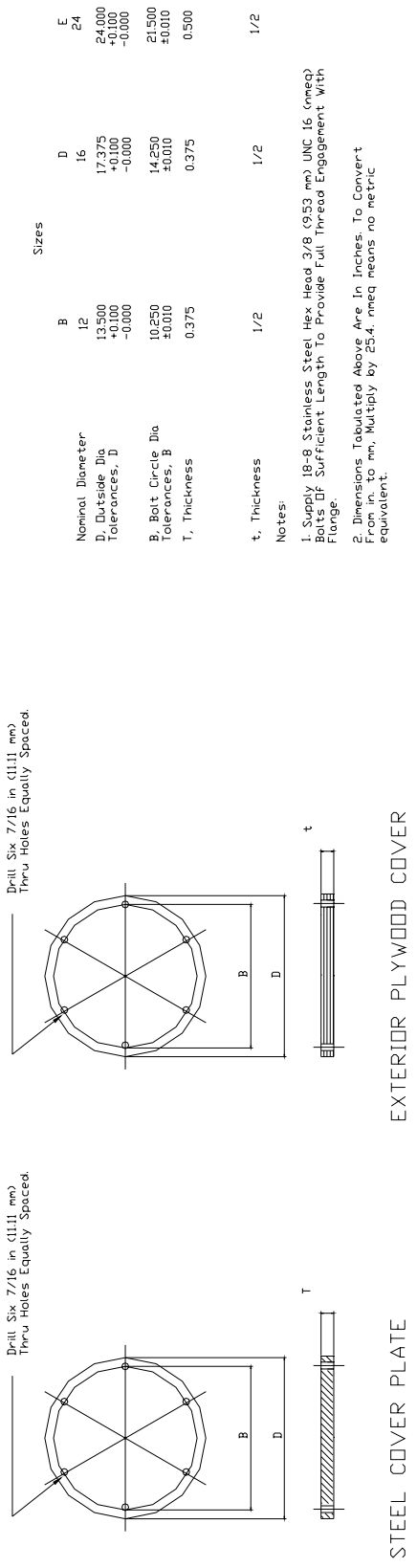


Figure 4. Accessories, Type L-867

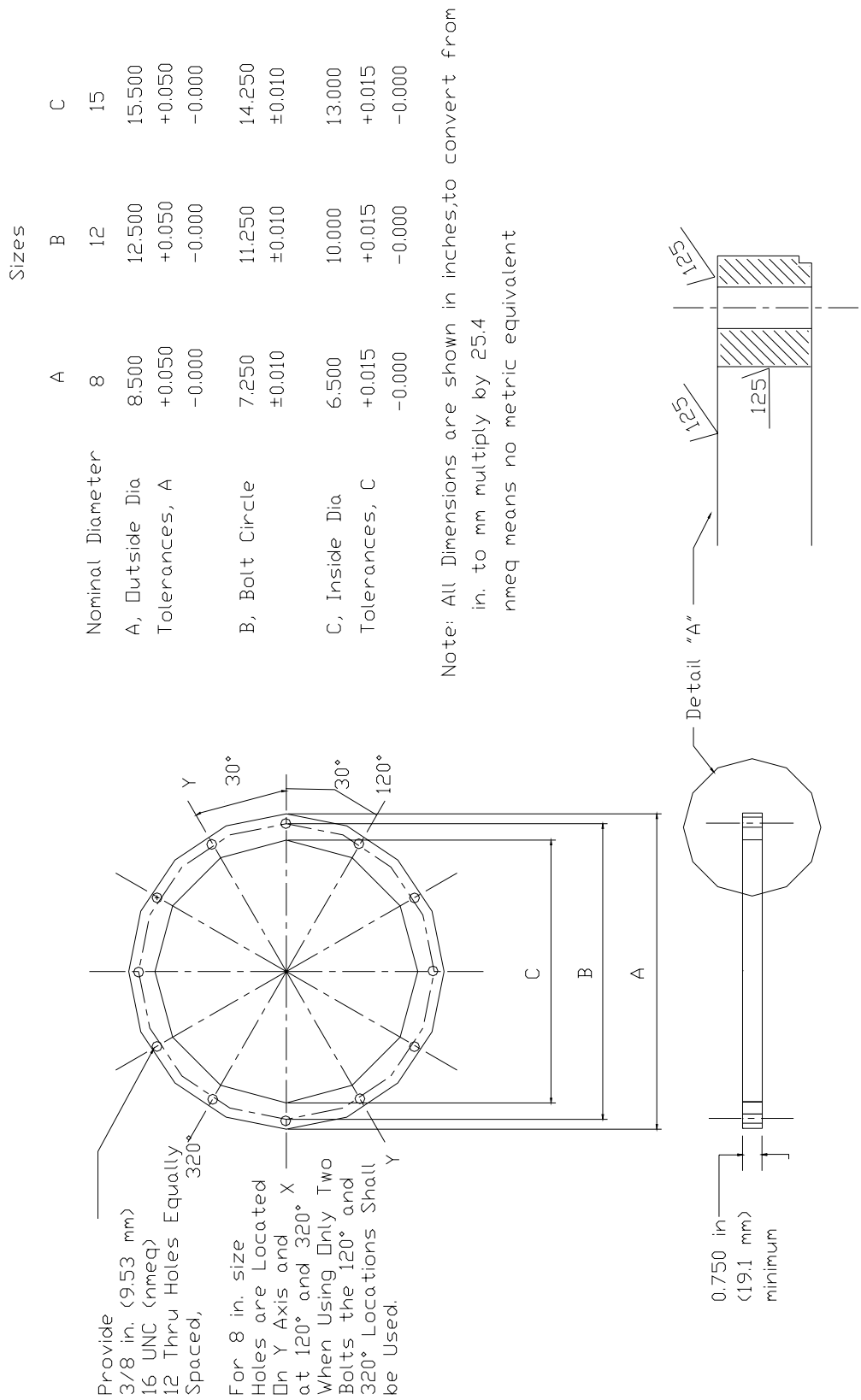
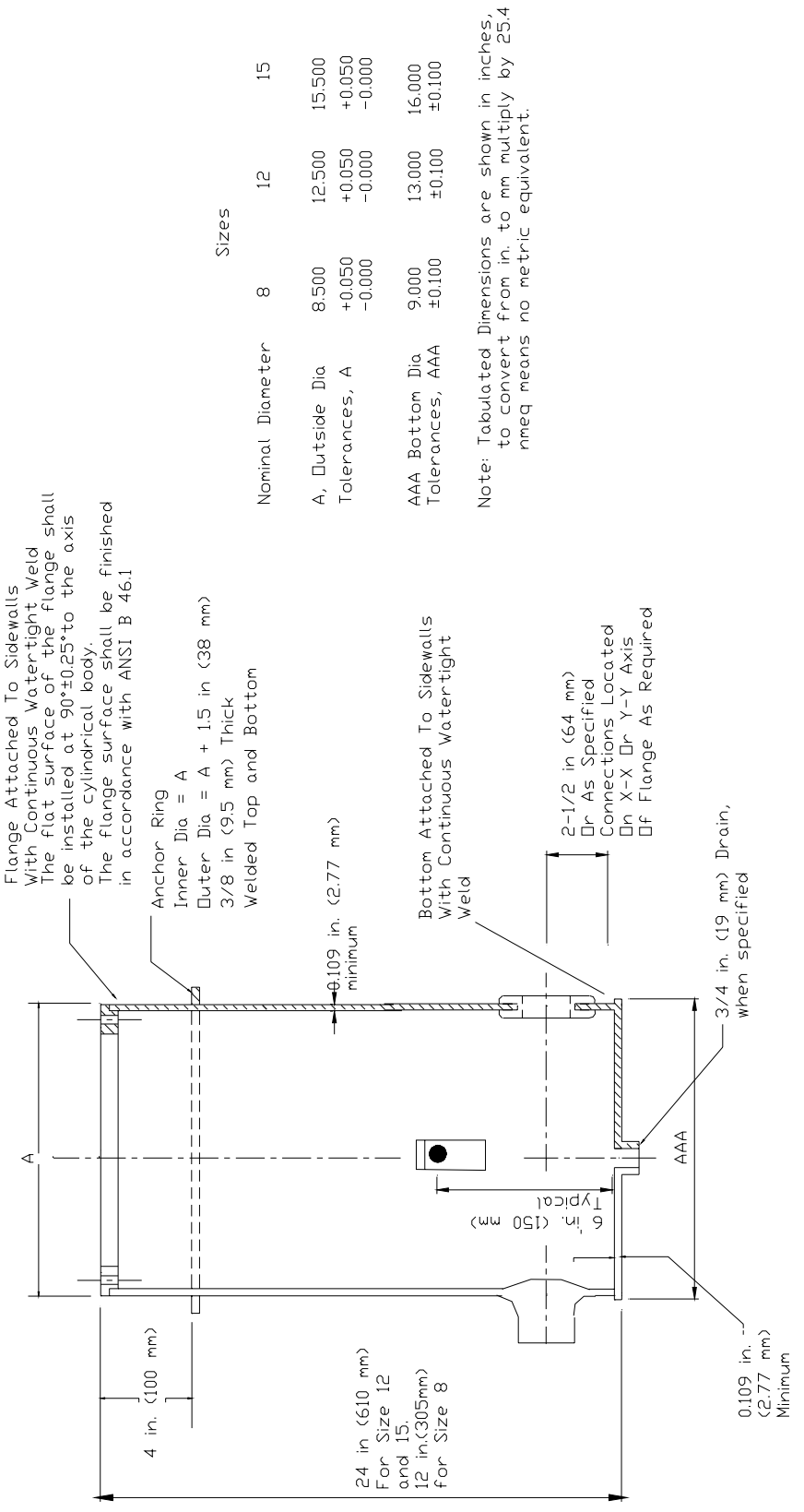


Figure 5. Flange, Type L-868, Class I



Nominal Diameter	Sizes 8	12	15
A, Outside Dia	8.500	12.500	15.500
Tolerances, A	+0.050 -0.000	+0.050 -0.000	+0.050 -0.000
AAA Bottom Dia	9.000	13.000	16.000
Tolerances, AAA	±0.100	±0.100	±0.100

Note: Tabulated Dimensions are shown in inches, to convert from in. to mm multiply by 25.4 mmeq means no metric equivalent.

Figure 6. Body, Type L-868, Class I

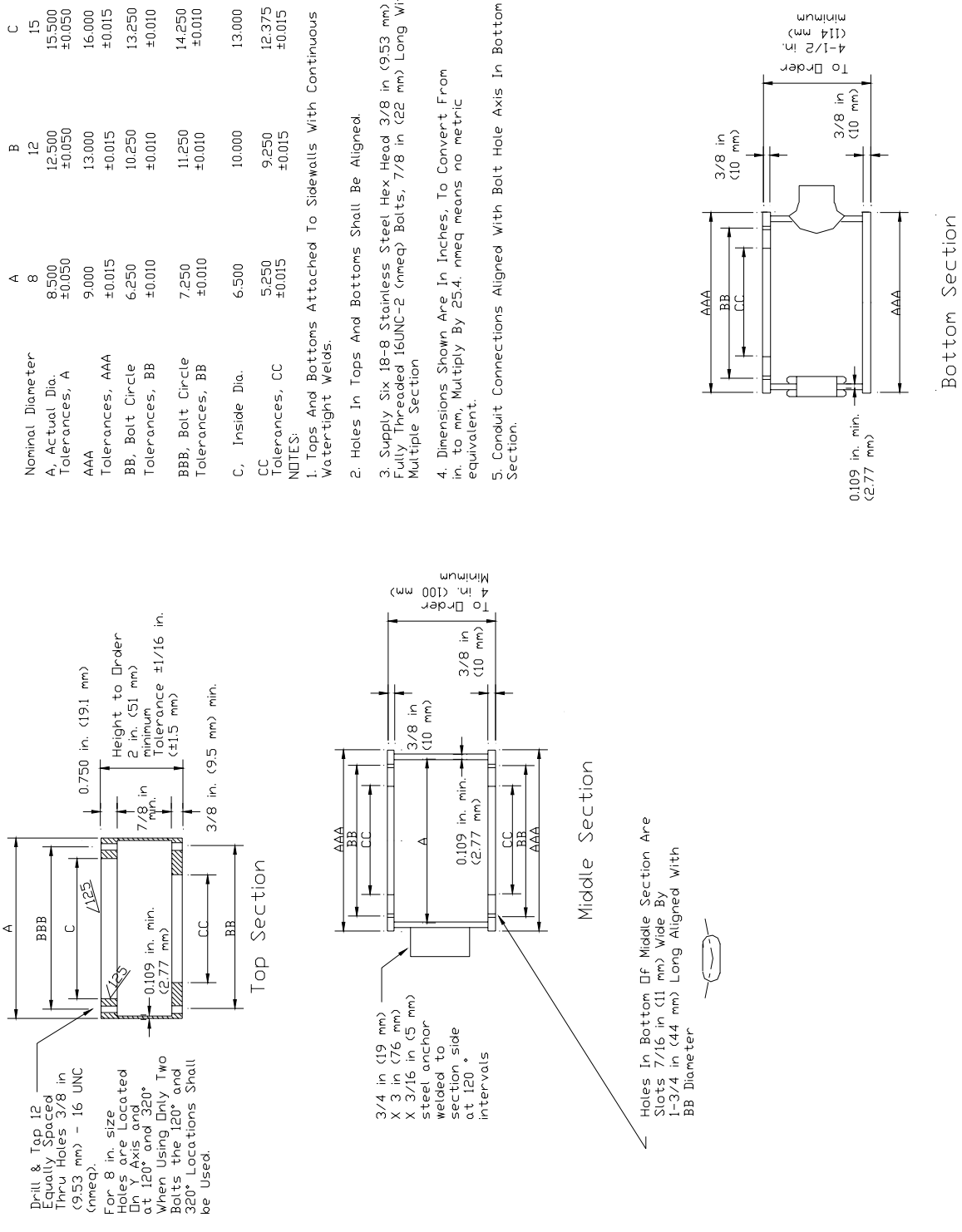


Figure 7. Sectional Body, Type L-868, Class I

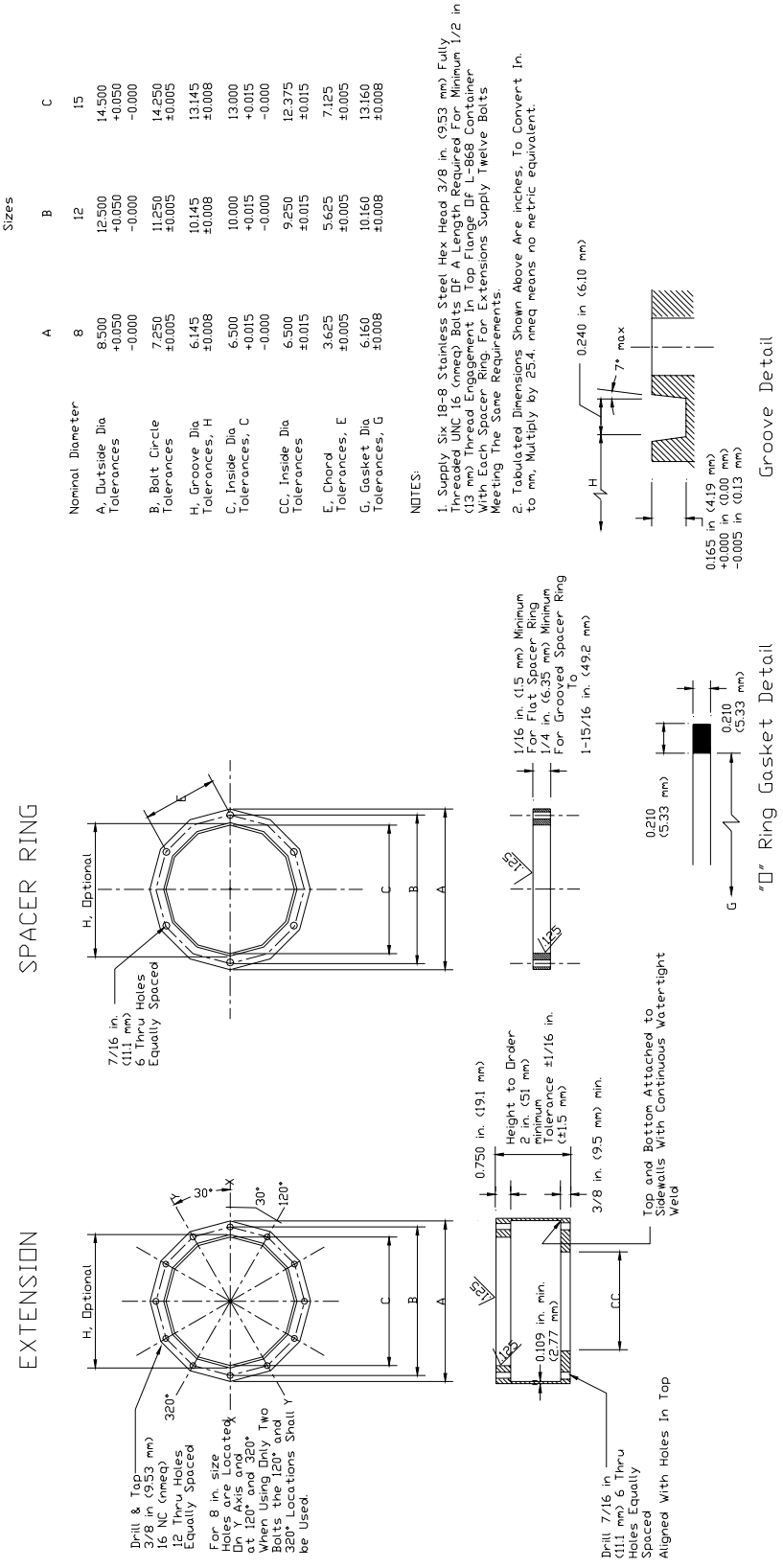


Figure 8. Extensions, Type L-868 Class I

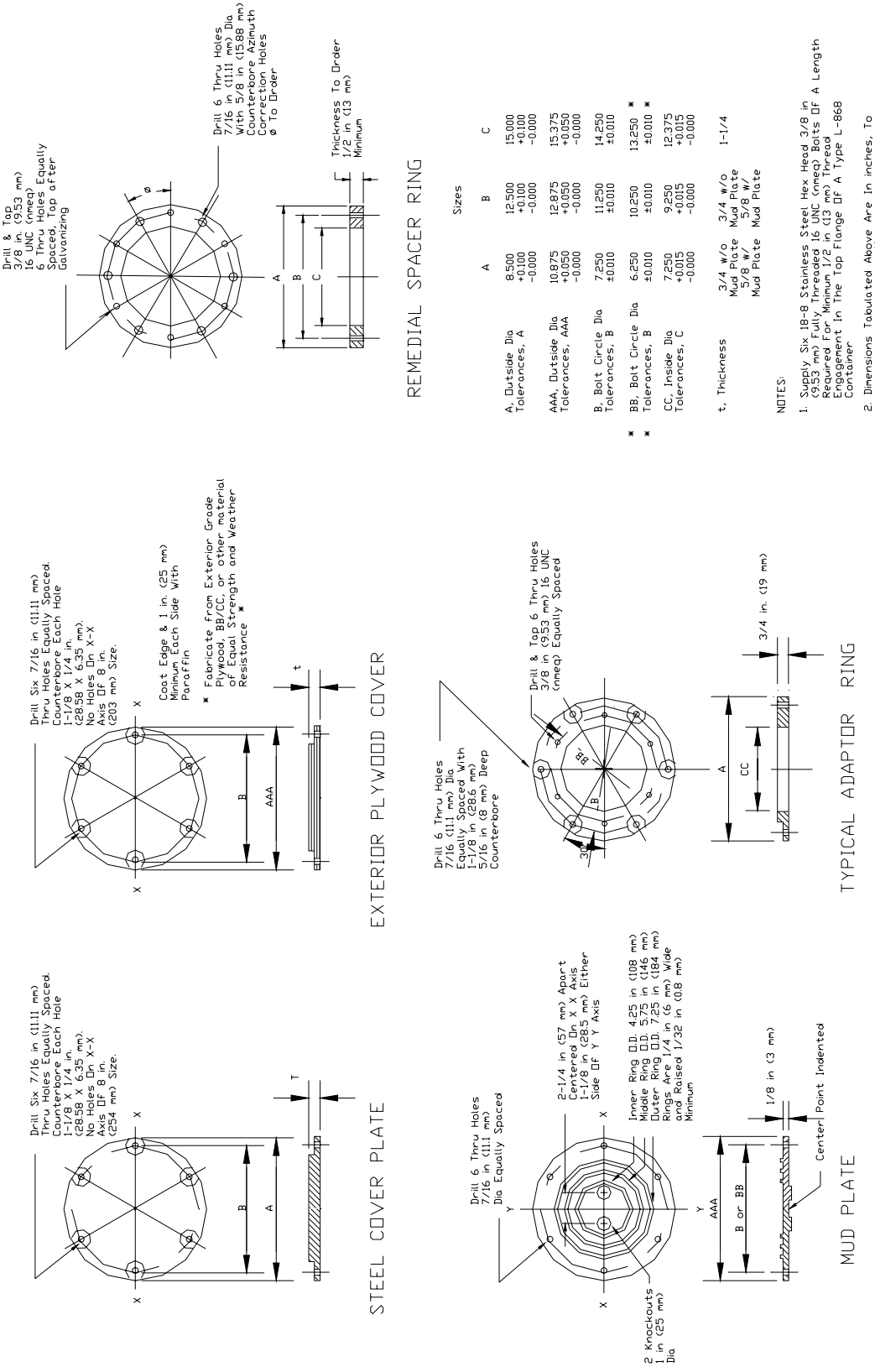


Figure 9. Accessories, Type-L868